

# 3 New Aerosol Observing Systems and the ASP Data Archive

*Stephen R. Springston*

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*Boulder, CO*



*a passion for discovery*



# Equipment

## MAOS

CCN-200

PSAP

PASS-3

SP2 (~5 GB/h!!)

Dual Nephelometer Hygrometer

**CPC (>10 nm)**

**CPC (>2.5 nm)**

UHSAS

SMPS

HTDMA

UHSAS

PILS

PTRMS

Carbon Monoxide

**Ozone**

**Sulfur Dioxide**

NO<sub>x</sub> (NO, NO<sub>2</sub>, NO<sub>y</sub>)

SODAR

Profiler

## AMFII AOS

CCN-200

PSAP

Dual Nephelometer Hygrometer

**CPC (>10 nm)**

HTDMA

**Ozone**

## TWP-D AOS

CCN-200

PSAP

Dual Nephelometer Hygrometer

**CPC (>10 nm)**

HTDMA

**Ozone**

## AAF (BNL effort)

PILS

SMPS

SP2

Carbon Monoxide

**Ozone**

**Sulfur Dioxide**

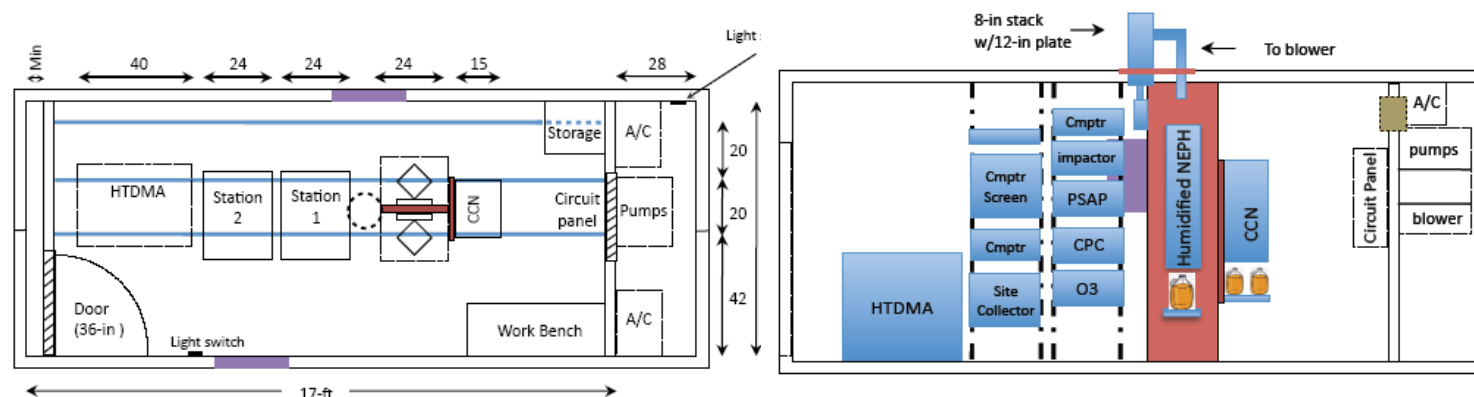
NO<sub>x</sub> (NO, NO<sub>2</sub>, NO<sub>y</sub>)

# Character

- Self Contained
  - Power
  - Internet
- Portable/Robust
  - Instruments permanently installed (shock mounted), plumbed, wired
  - Pumps, electrical service entrance installed in ventilated vestibule
  - External items shipped internally (inlet)
  - Turtle mode in ~8 h
- Flexible
  - Heat/Cold, Wind
  - Marine/Land
  - Guest instruments (power, rack space, sampling, computers)
  - Bandwidth availability
  - Comparability

# Bluish Prints

## PLAN – Tropical West Pacific/Darwin Aerosol Observing System



### Notes:

Shares same layout with AMF-II  
Insulated Walls (assumed thickness: 4 in)

Station 1: PSAP; Impactor; CNC; O3; power dist.

Station 2: Site Collector; instrument computer; power dist.

- Rails for instrument rack mounting (structural assessment required)
- Portal for future use (2' x 2')
- Egress (main door & emergency kick out panel)
- Plate for aerosol inlet

	S. R. Springston & A. J. Sedlacek		TWP/Darwin AOS layout
	9/15/09	Revision: 06	Number <u>1</u> of 5
	All units inches, unless explicitly stated		File: 090915_TWP_rev6



# The Tale of 5 Inlets

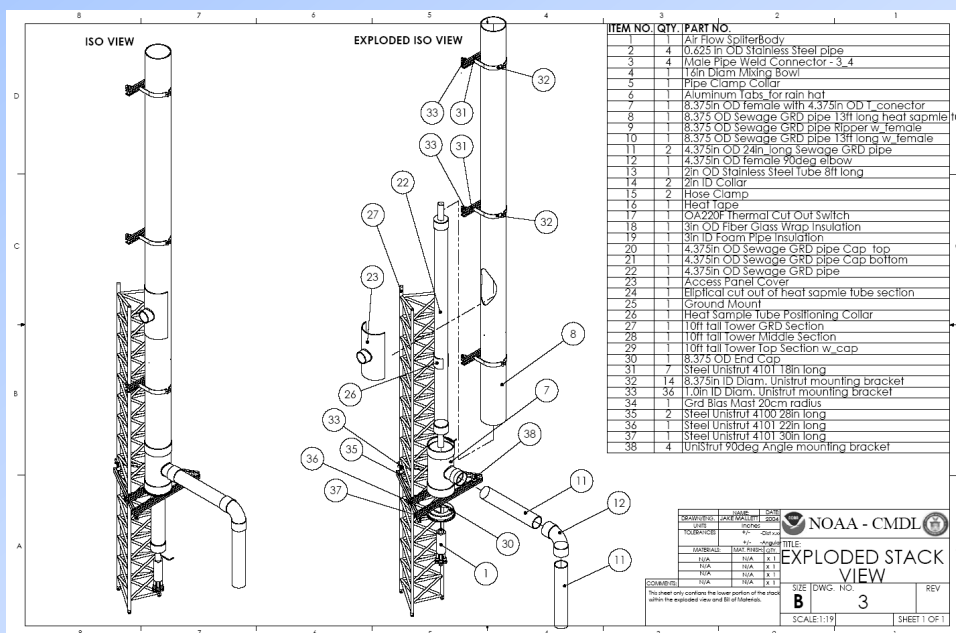
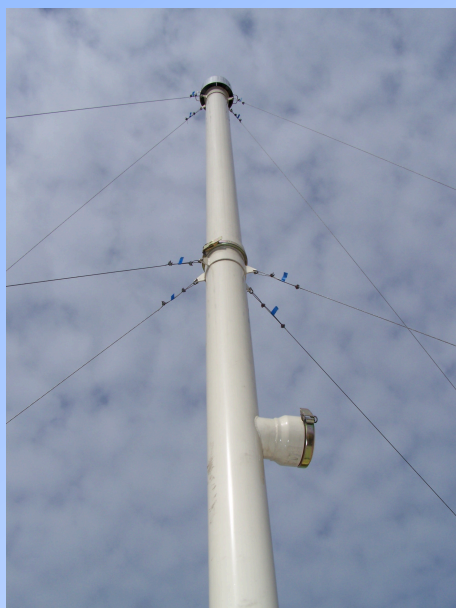
## Aerosol Inlet

5 x 30 LPM sample flows

Two stage RH control

Short transfer distance

Minimal horizontal runs



AMFII AOS: Land, Marine

MAOS: Land, Trace Gas

TWP-D AOS: Land

# Computer Philosophy

Redundant Array of Inexpensive Computers (Fanless)

Program Instrument Acquisition and Control in LabView

Local/Remote/Autonomous Operation

Infrastructure Computer (inlet control, environmental, AOS restart)

All data to ARM archive

The screenshot shows a LabVIEW front panel for an Ozone measurement system. It includes a header section with logos and measurement details, a central time series graph, a status table, and various control and display elements at the bottom.

**Measurement Details:**

- Measurement: **Ozone** mode, status
- Instrument: TEI Model 49i Ozone Analyzer
- Data File: nnnn.nn started: yyyy-mm-dd hh:mm:ss ending: yyyy-mm-dd hh:mm:ss
- Config File: nnnn.nn

**VI Specs:** Name, Date, Version

**Instrument Data:**

Time Series Graph

**Radio Buttons:** X-axis, 5 min, 1 h, 1 day

	Status	Last valid value	Nominal value	Time	Elapsed	Next Time	In
Instrument Communicating	Yes/No	ssssss		hh:mm:ss	hh:mm:ss	hh:mm:ss	hh:mm:ss
Sample Mode	Active/Inactive	ffff.f		hh:mm:ss	hh:mm:ss	hh:mm:ss	hh:mm:ss
Zero Mode	Active/Inactive	ffff.f	ffff.f	hh:mm:ss	hh:mm:ss	hh:mm:ss	hh:mm:ss
Cal1 Mode	Active/Inactive	ffff.f	ffff.f	hh:mm:ss	hh:mm:ss	hh:mm:ss	hh:mm:ss
Cal2 Mode	Active/Inactive	ffff.f	ffff.f	hh:mm:ss	hh:mm:ss	hh:mm:ss	hh:mm:ss
Auto Mode	Active/Inactive						

**Flow and Alert Controls:**

- Flow A: ☐ Alert
- Flow B: ☐ Alert
- Temp.: ☐ Alert
- etc.: ☐ Alert

**Alert Code:** hhhhhhhhhh

**Output Data String:** 80s%

**Operator Comment:** 80s%

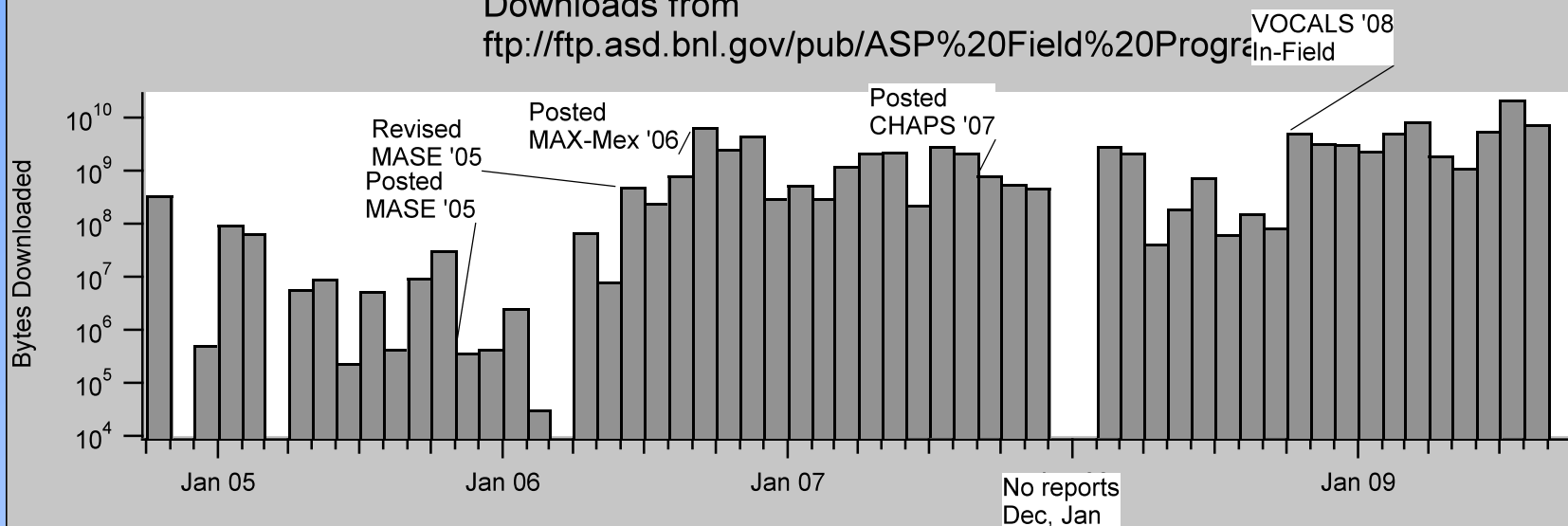
# ASP Data Archive

- RAF/AAF G-1 data going back to 1995
- Ground Data as resources permitted.
- Published Data Policy
- Consistent AND Flexible Data Structure
- Self Documenting
- ASCII
- QA/QC
- Value Added Products
- Anonymous ftp\*

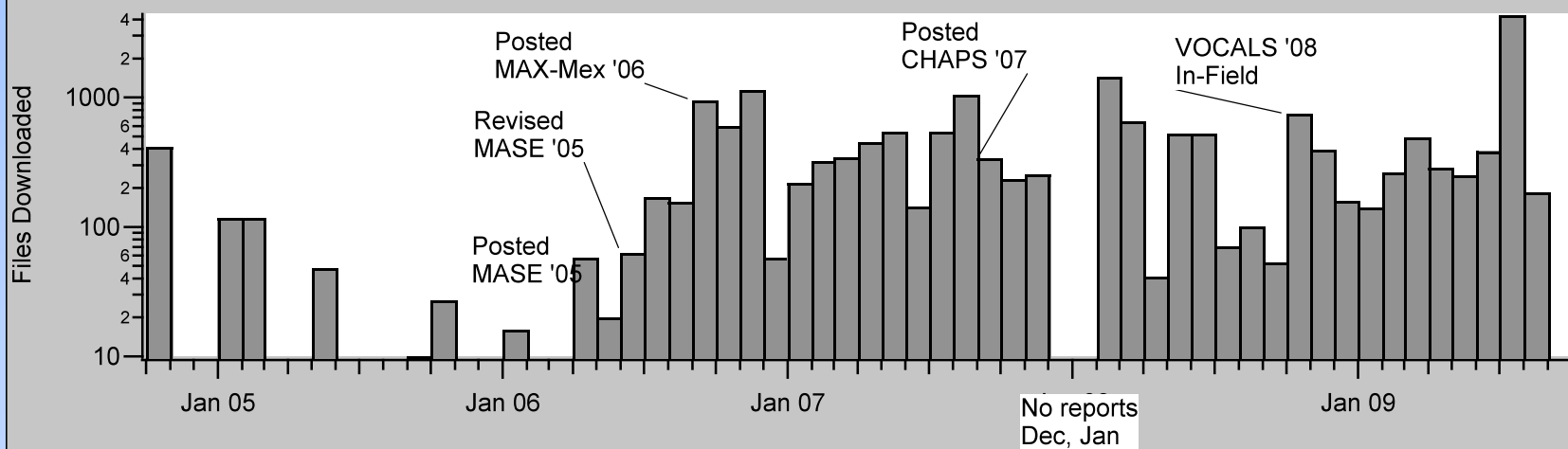
<ftp://ftp.asd.bnl.gov/pub/ASP%20Field%20Programs/>

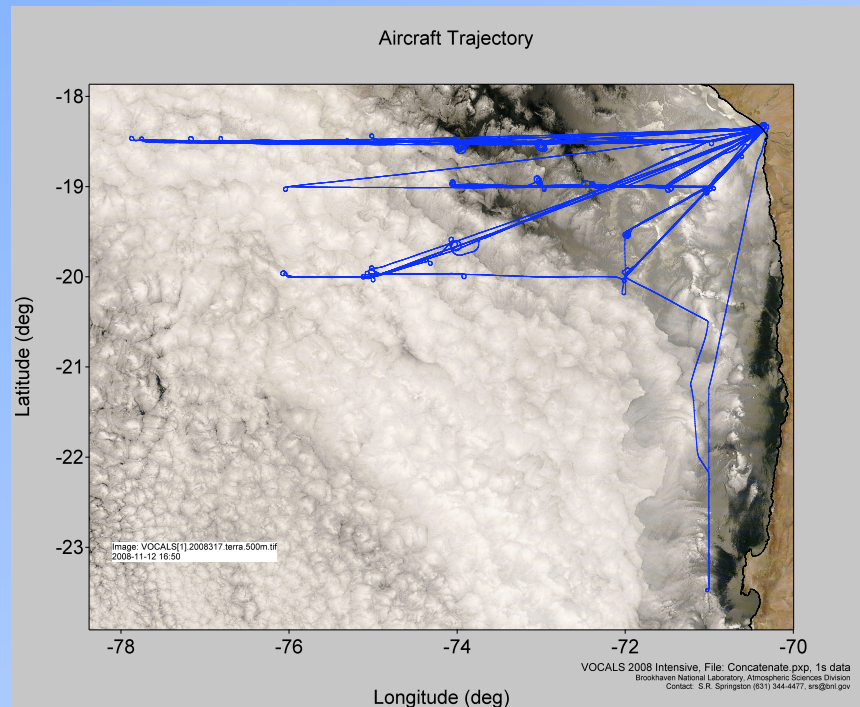
[ftp://VOCALS\\_DOE:Arical23@ftp.asd.bnl.gov/pub/ASP%20Field%20Programs/2008VOCALS](ftp://VOCALS_DOE:Arical23@ftp.asd.bnl.gov/pub/ASP%20Field%20Programs/2008VOCALS)

# Downloads from ftp://ftp.asd.bnl.gov/pub/ASP%20Field%20Programs/



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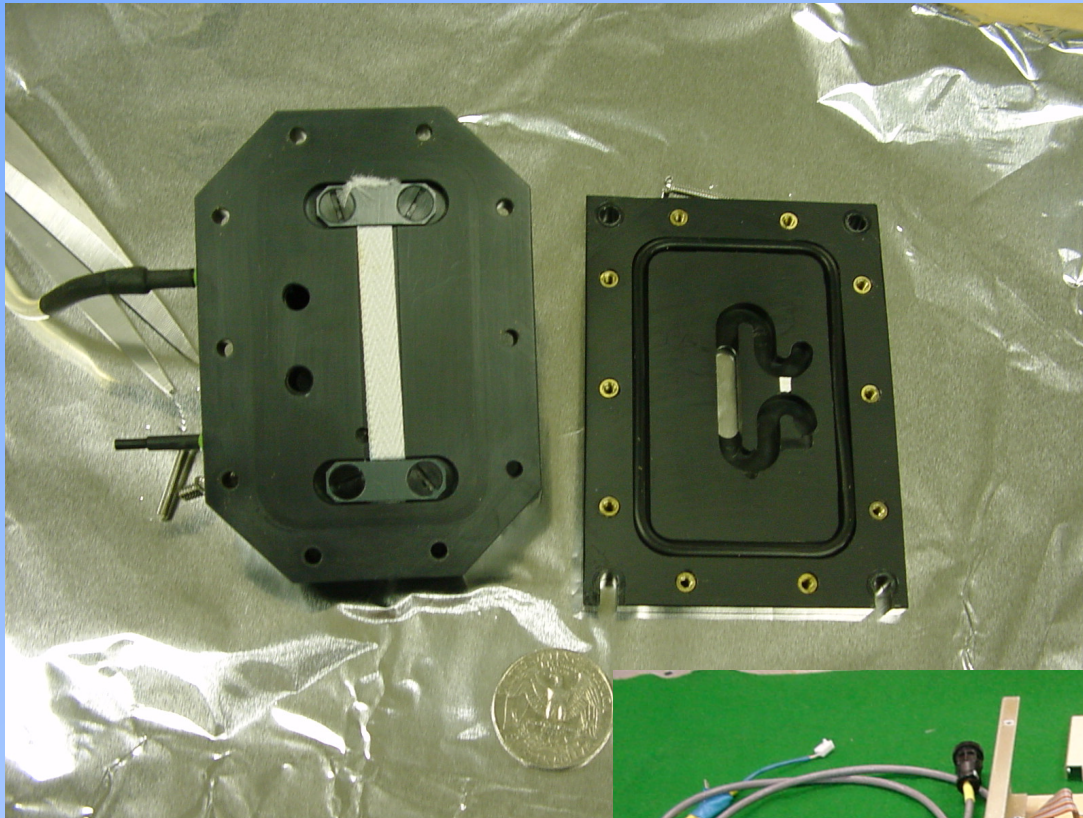
17 Research Flights  
62:52 Flight Time  
~22,000 km  
~14 GB raw data\*

Compare: ~2.5 GB CHAPS 07

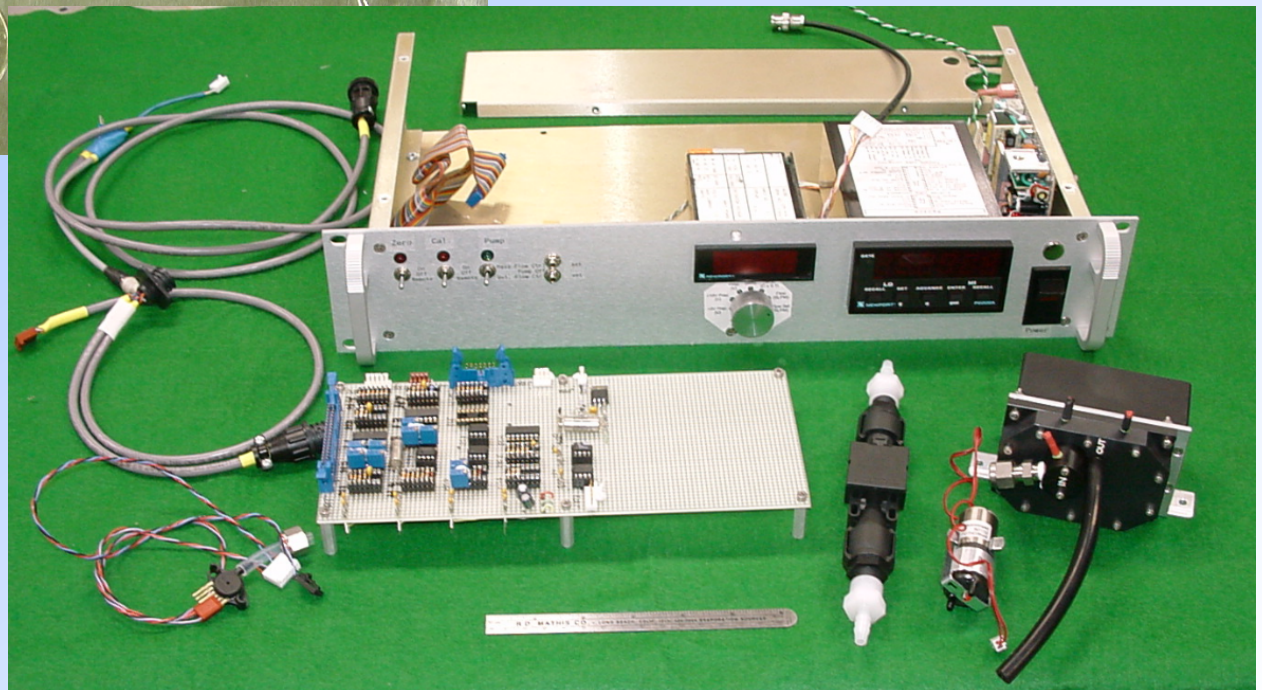
WHY SO MUCH?

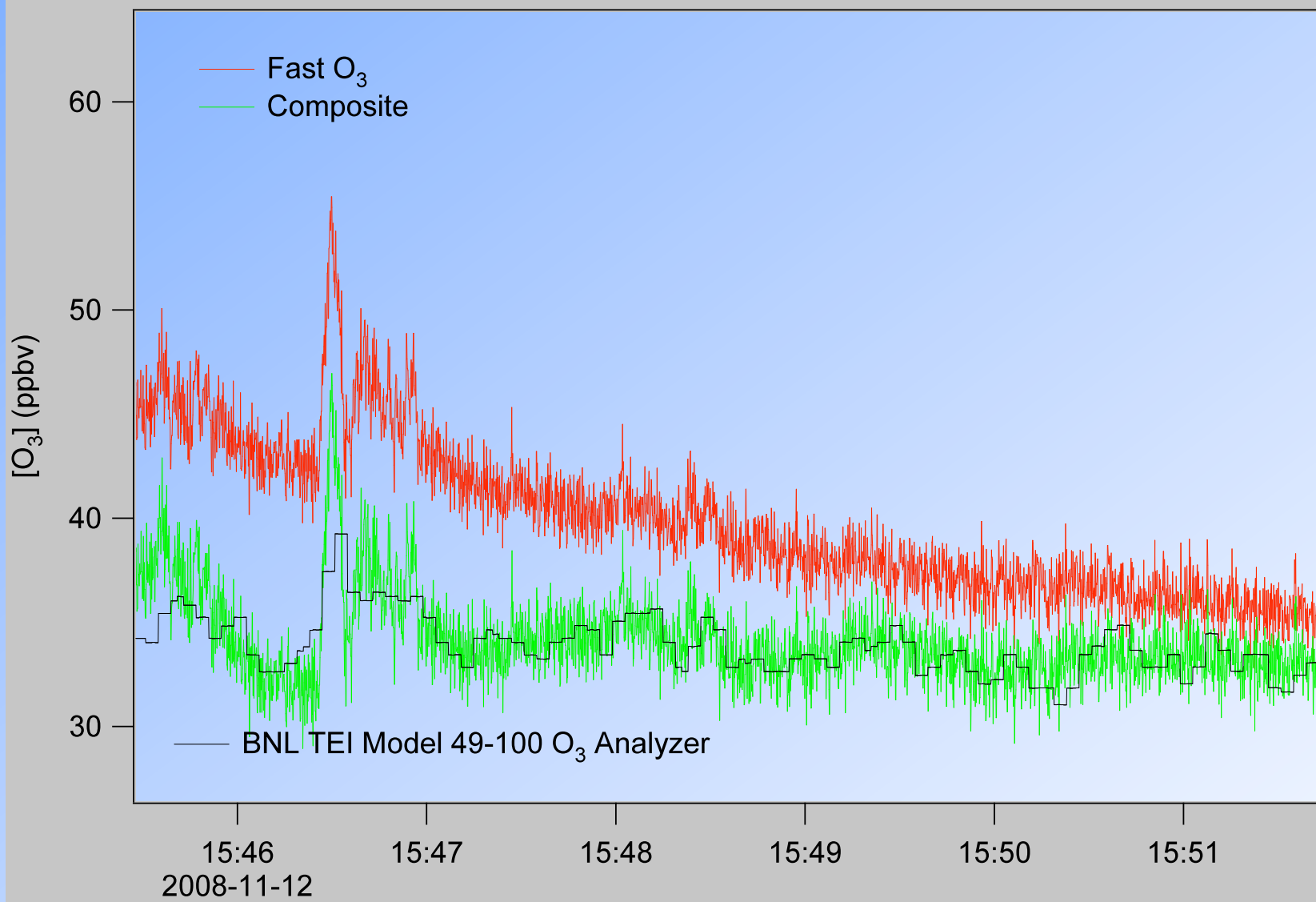


## Basic Fast Ozone Monitor

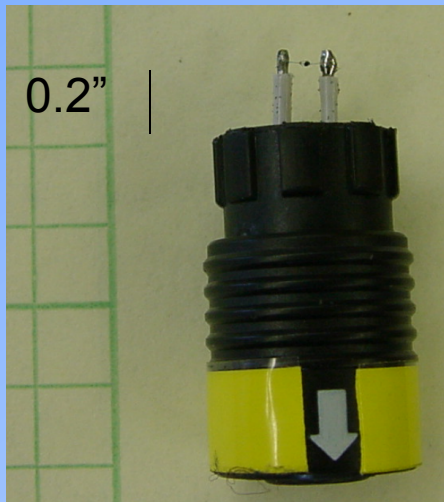


8-lbs  
2U height  
~25 W









0.013"  
diam

